

REMARKS/ARGUMENT

Applicants' acknowledge the Examiner's objection to the disclosure. By this amendment, the reference numeral "128" associated with "data array" on page 23 of the specification has been amended to instead be --238--. As such, the objection is overcome.

Applicants' further acknowledge the Examiner's objection to the drawings under 37 CFR 1.83(a) because they fail to show item 128 (data array) in Figure 9 as described in the specification. As stated above, by this amendment, the reference numeral "128" associated with "data array" on page 23 of the specification has been amended to instead be --238--. As such, the objection is overcome.

Applicants respectfully traverse the 35 USC 112, first paragraph, rejection of Claim 19. A "local variable" is still a "variable". Accordingly, Claim 19 does NOT contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is not nearly connected, to make and/or use the invention, as suggested by the Examiner.

Applicants direct the Examiner to two Supreme Court cases in which the Court held that it is not necessary to recite in the claim everything necessary to operate the device. As stated by Joseph Gray Jackson in *The Art of Drafting Patent Claims*, 59-60:

In Deering v. Winona, 155 U.S. 286 (1894), the device was an agricultural machine and lacked the support necessary for the board which was an element of the claim. The Supreme Court, said, "True that it is necessary and true it is not in the claim but it does not have to be; the claim does not have to include everything that is required to operate."

The other case is Special Equipment v. Coe, 324 U.S. 370, 64 USPQ 525 (1945), in which a subcombination claim was supported which related to a machine for cutting, peeling and coring pears, and there was no cutting knife involved in the claim. The Supreme Court said it is perfectly all right; you do not have to have everything required to operate this device in the claim. Completeness is a much inflated "bugaboo" which is mainly of interest to certain examiners in the Patent Office, and should not really concern them. The claim is not a description of the device in any case. It is like a fingerprint which identifies the device. The fingerprint looks not at all like the person, but it is an identification of the person, and that is what we are interested in - identification.

If the Examiner is really rejecting Claim 19 because he feels the term "variables" is overly broad, MPEP 706.03(d), paragraph 2, states, "The fact that a claim is broad does not necessarily justify a rejection on the ground that the claim is vague and indefinite or incomplete. In non-chemical cases, a claim may, in general, be drawn as broadly as permitted by the prior art." Applicants respectfully point out that a claim, no matter how broad, is not indefinite as long as the boundaries of the claim are capable of being understood. Applicants' Claim 19 is clear, definite, complete and capable of being understood. The present case is a non-chemical case and the breadth of Claim 19 is permitted by the prior art.

Claims 1 and 10 have been amended better to define the claimed invention and overcome the 35 U.S.C. 112, first paragraph, rejection.

1) Claims 1, 2, 5, 6, 10, 11, 13, 14, 19 and 20 stand rejected under 35 U.S.C. 102(b) as being unpatentable over Tremblay et al. [6,067,602] (hereinafter "Tremblay"). Applicants respectfully traverse this rejection as set forth below.

In order that the rejection of Claims 1, 2, 5, 6, 10, 11, 13, 14, 19 and 20 be sustainable, it is fundamental that “each and every element as set forth in the claim be found, either expressly or inherently described, in a single prior art reference.” Verdegall Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See also, Richardson v. Suzuki Motor Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), where the court states, “The identical invention must be shown in as complete detail as is contained in the ... claim”.

Furthermore, “all words in a claim must be considered in judging the patentability of that claim against the prior art.” In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Independent Claim 1, as amended, requires and positively recites, a cache subsystem, comprising: “a cache controller” and “a data memory coupled to the cache controller, the data memory holds a contiguous block of memory defined by an address stored in a register accessible to the cache controller; wherein the data memory is adapted to store two groups of local variables, a first group comprising **local variables associated with finished methods** and a second group comprising **local variables associated with unfinished methods**” and “wherein, **based on a threshold value, local variables associated with the second group are fetched from memory that is external to the cache subsystem**”.

Independent Claim 10, as amended, requires and positively recites, a processor adapted to couple to external memory, comprising: “a processing core on which a plurality of methods execute” and “a cache subsystem accessible to the processing core and comprising a data memory coupled to a cache controller, the data memory holds a contiguous block of memory defined by an address stored in a register accessible to the cache controller”, “wherein the data memory is adapted to store a first group of **local variables associated with finished methods** and a second group of **local variables**”.

associated with unfinished methods” and “wherein, based on a threshold value, local variables associated with the second group are fetched from memory that is external to the cache subsystem”.

Independent Claim 19, as amended, requires and positively recites, a method, comprising: “allocating space in a data memory in which variables are stored that are used by methods”, **“setting a value indicative of which variables are used by finished methods and which variables are used by unfinished methods”** and **“wherein, based on the value, fetching local variables associated with the second group from external memory that is separate from the data memory”.**

In contrast, Tremblay splits Java stack frames into two different physical stacks (and maybe main memory) in order to be able to address different parts of the frames efficiently. In particular, the local variables of different methods are saved into these two stacks alternating between them at invocation order. Tremblay thus discloses a cache architecture with multiple stack caches where local variables of successive methods are saved in different stacks. In Tremblay’s technique, the methods A, B, C, D are called sequentially (e.g., A invokes B, B invokes C and C invokes D) and therefore B cannot be finished if C is not. Therefore, as A invokes B, B invokes C and C invokes D, all methods being unfinished (alive). Thus, Tremblay does not address optimizing memory accesses for context changes.

Accordingly, it is inappropriate for the Examiner to rely upon Figures 4A-D to define the separation between finished and unfinished methods. As such, Tremblay fails to teach or suggest, wherein the data memory is adapted to store two groups of local variables, a first group comprising **local variables associated with finished methods** and a second group comprising **local variables associated with unfinished methods”**, as required by Claim 1, OR “wherein the data memory is adapted to store a first group of

local variables associated with finished methods and a second group of **local variables associated with unfinished methods**", as required by Claim 10, OR **"setting a value indicative of which variables are used by finished methods and which variables are used by unfinished methods"**, as required by Claim 19.

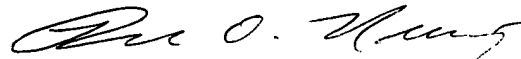
Similarly, since Tremblay does not teach or suggest a specific cache policy to reduce traffic between a local variable cache and external memory. The Examiner is incorrect in determining that the standard stack cache mechanism controlling the overflow/underflow of the stack cache management unit 710-720-730 during a single java thread execution is the same one as described in Applicants' disclosure to optimize cache fetch/write back during and after thread switch. As such, Tremblay further fails to teach or suggest, **"wherein, based on a threshold value, local variables associated with the second group are fetched from memory that is external to the cache subsystem"**, as required by Claim 1, OR **"wherein, based on a threshold value, local variables associated with the second group are fetched from memory that is external to the cache subsystem"**, as required by Claim 10, OR **"wherein, based on the value, fetching local variables associated with the second group from external memory that is separate from the data memory"**, as further required by Claim 19. Accordingly, the 35 U.S.C. 102(b) rejection of Claims 1, 10 and 19 over Tremblay are overcome.

Claims 2, 5, 6, 11, 13, 14, and 20 stand allowable as depending directly, or indirectly, from respective allowable Claims 1, 10 and 19. New Claims 22-27 stand allowable as depending directly, or indirectly, from respective allowable Claims 1, 10 and 19. New Claim 28 similarly stands allowable.

Applicants appreciate the Examiner's determination that Claims 3, 4, 7-9, 12, 15-18 and 21 would be allowable if amended to include the limitations of the base claim and

any intervening claims. However, Applicants believe Claims 3, 4, 7-9, 12, 15-18 and 21 are allowable in their current form for depending from allowable claims. Claims 1-21 are allowable over the cited art. Applicants respectfully requests withdrawal of the rejections and allowance of the application at the earliest possible date. For the record, Applicants note that their amendments to Claims 1, 10 and 19 were purely to overcome an indefiniteness rejection under 35 U.S.C. 112, second paragraph, and not to overcome any prior art.

Respectfully submitted,



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